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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/821,868

04/12/2004

Jussi Pihlajamaa

060282.00150

1847

32294 7590 02/01/2008
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EXAMINER

THIER, MICHAEL

ART UNIT

PAPER NUMBER

2617

MAIL DATE

DELIVERY MODE

02/01/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/821,868	Applicant(s) PIHLAJAMAA ET AL.	
	Examiner Michael T. Thier	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/28/2007, with respect to the rejection(s) of claim(s) 1-16 under 35 U.S.C. 103(a) have been fully considered and are persuasive. The applicant argued that the Gunzelmann et al. (US 2004/0097250) reference was not a proper reference since the international application to which it claimed benefit was not published in English. The examiner has found a translation of the international publication (which is provided along with this rejection), and will replace the US version (US 2004/0097250) with the WO/02091601 (i.e. which is the publication number of PCT/DE02/01673), which was published on 11/14/2002, thus being a proper 102(b) date. (published more than 1 year prior to the effective US filing of the instant application)

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bridgelall (US 6717516) in view of Gunzelmann et al. (WO/02091601).

Regarding claims 1, 6, 13, 17, and 22. Bridgelall teaches a radio equipment system having a modular structure (figure 2), the system comprising:

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a baseband modem for modulating and demodulating; (figure 2 item 46, baseband means)

a digital interface; (figure 2 item 42, digital interfacing means) and

a radio frequency unit including a digitally operating radio frequency control unit and a radio frequency parts unit, (figure 2 item 34, the RF unit is inherently digitally operated and column 2 lines 31-39, column 5 lines 1-15)

wherein the baseband modem and the radio frequency unit respectively form physically separate modules which are connected with each other by the digital interface. (see figure 2 which shows the RF unit 34, outside the box 58, which contains the baseband modem 46)

However, Bridgelall does not specifically disclose that the RF module and the baseband modem are physically separate modules connected by a digital interface.

Gunzelmann teaches a transmission configuration in figure 1 (shown on front cover, along side of the abstract). He clearly shows the baseband module, item 1, being physically separate from the RF unit, item 3, and connected by a digital interface, item 2. Further see the 4th paragraph on the 1st page of the translation, which clearly states that the baseband parts and the RF parts are separate from one another (i.e. separate integrated circuits (chips)). The examiner would further like to point to the abstract or the 7th paragraph on the 1st page of the translation (starts with According to invention...) which explains the baseband component (baseband construction unit), radio frequency unit including digitally operating frequency control means and radio frequency parts, (i.e. high frequency construction unit using digital data transmission) and the digital

interface (interface 2, having exclusively digital structure), which therefore teaches all the limitations of the claims, except for the fact that the baseband module includes a baseband modem, which is clearly taught by the primary reference, Bridgelall, in figure 2 item 46.

Regarding claims 2 and 18. Bridgelall further teaches wherein the module forming the baseband modem comprises: correction means for performing forward error correction coding and decoding; and symbol mapping means for symbol mapping and demapping. (column 5 lines 1-15, 29-45 and column 7 lines 33-38 read on the limitations in this claim)

Regarding claims 3, 5, 19, and 21. Bridgelall further teaches wherein the radio frequency control means comprises respective control loops for pulse shape filtering, transmitter and receiver correction loops, timing recovery means for performing receiver timing recovery, and carrier recovery means for performing carrier timing recovery. (column 5 lines 29-45 reads on the limitations in this claim)

Regarding claims 4 and 20. Bridgelall further teaches wherein the transmitter and receiver correction loops comprise quadratic error correction means for performing quadratic error correction, balance error correction means for performing balance error correction, bias error correction means for performing bias error correction, and a gain error correction means for performing bias error correction. (column 5 lines 29-45 reads on the limitations in this claim, the different types of correction means are well known in the art and would have been obvious to one of ordinary skill to allow for the correct signal to be transmitted without error.)

Regarding claims 7 and 25. Bridgelall further teaches sending, from the baseband modem module to the radio frequency unit module, transmitter data including in-phase component signals and quadratic phase component signals; sending, from the baseband modem module to the radio frequency unit module, transmitter clock signals; sending, from the baseband modem module to the radio frequency unit module, control signals providing support for type-specific functionalities; sending, from the radio frequency unit module to the baseband modem module, receiver clock signals; sending, from the radio frequency unit module to the baseband modem module, receiver data including in-phase component signals and quadratic phase component signals; and exchanging, between the radio frequency unit module and the baseband modem module, microprocessor signals; wherein said sending steps and said exchanging step are driven by the digital interface. (column 5 lines 29-45 and column 6 line 37 to column 7 line 3 reads on the limitations in this claim)

Regarding claim 8. Bridgelall further teaches said method further comprising providing all signals as digital signals, and wherein a clock rate is provided as a system symbol clock rate, except for a case that a function in the modem utilizes two samples per symbol where a double symbol rate frequency is supported. (column 2 lines 31-38 and column 6 line 37 to column 7 line 3 reads on the limitations in this claim)

Regarding claim 9. Bridgelall further teaches the steps of: forward error correction coding and decoding; symbol mapping and demapping; and implementing the forward error correction coding and decoding and symbol mapping and demapping

steps in the baseband modem. (column 5 lines 1-15, 29-45 and column 7 lines 33-38 read on the limitations in this claim)

Regarding claims 10 and 12. Bridgelall further teaches wherein the radio frequency control means within the module forming the radio frequency unit includes respective control loops performing pulse shape filtering, transmitter and receiver correction, receiver timing recovery and carrier recovery. (column 5 lines 29-45 reads on the limitations in this claim)

Regarding claim 11. Bridgelall further teaches wherein the transmitter and receiver correction comprises a quadratic error correction, a balance error correction, a bias error correction, and a gain error correction. (column 5 lines 29-45 reads on the limitations in this claim, the different types of correction means are well known in the art and would have been obvious to one of ordinary skill to allow for the correct signal to be transmitted without error.)

Regarding claims 14 and 23. Bridgelall further teaches wherein the signals are exchanged serially. (column 7 lines 4-37)

Regarding claims 15 and 24. Bridgelall further teaches wherein the signals are exchanged in parallel. (column 7 lines 4-37)

Regarding claim 16. Bridgelall further teaches further comprising: first sending means for sending, from the baseband modem module to the radio frequency unit module, transmitter data including in-phase component signals and quadratic phase component signals; second sending means for sending, from the baseband modem module to the radio frequency unit module, transmitter clock signals; third sending

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means for sending, from the baseband modem module to the radio frequency unit module, control signals providing support for type-specific functionalities; fourth sending means for sending, from the radio frequency unit module to the baseband modem module, receiver clock signals; fifth sending means for sending, from the radio frequency unit module to the baseband modem module, receiver data including in-phase component signals and quadratic phase component signals; and exchanging means for exchanging, between the radio frequency unit module and the baseband modem module, microprocessor signals. (column 5 lines 29-46, and column 6 line 37 to column 7 line 38 reads on the limitations in this claim)

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael T. Thier whose telephone number is (571) 272-2832. The examiner can normally be reached on Monday thru Friday 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc Nguyen can be reached on (571) 272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Michael T Thier
Examiner
Art Unit 2617
1/29/2008



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